CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: February 22, 2005 FILE REF:

TO: WPDES Permits Staff

FROM: Russ Rasmussen, Director, Bureau of Watershed Management

SUBJECT: 316(b) Cooling Water Intake Structure (CWIS) Program Guidance

Section 316(b) of the Clean Water Act requires, and Chapter 283.31(6), Wis. Stats., allows the Department to require that the location, design, construction, and capacity of cooling water intake structures (CWIS) reflect the best technology available (BTA) for minimizing adverse environmental impact. Essentially, the goal of s. 316(b) is to minimize impingement mortality and entrainment (IM&E) of organisms in the area around a CWIS. The attached guidance document describes the information needed to evaluate the potential impacts of an intake structure and to determine whether BTA is being used (or proposed) to minimize adverse environmental impacts.

Many staff will only need to know how s. 316(b) requirements fit into the WPDES permitting process. This 4-page memo should provide enough explanation for them. Individuals who only need to know the basic process, may want to consult the attached flowchart. (Note: this flowchart is formatted for legal-size paper - so you'll have to visit your printer midway through if you print this document and all of its attachments!). This memo and the flowchart should help staff to first understand the main points, before they delve into the detailed discussion provided in the attached guidance document, or try to tackle the more complex federal regulations (found at: http://www.epa.gov/ost/316b/). Staff can choose the level of detail that they want to digest.

In the attached document, general guidance is provided which outlines the development, conduct, and review of studies designed to evaluate the potential for adverse environmental impact from a CWIS. Although general guidelines are provided, environment-intake interactions are highly site-specific, therefore, BTA decisions will need to be made on a case-by-case basis.

The Three "Phases" of 316(b) Regulations

EPA is developing regulations under section s.316(b) of the Clean Water Act in 3 phases:

- **Phase I: New Facilities** (final regulation, 40 CFR Part 125.83)
  Phase I applies to any new facility (a "greenfield" or "stand-alone" facility) that started construction after January 2002, has a design intake flow > 2 MGD, and uses ≥ 25% of the water withdrawn for cooling purposes. The Phase I rule allows BTA to be demonstrated in one of two ways:

  Track I Requirements:
  1. Use closed-cycle recirculating cooling water system
  2. Through-screen intake velocity ≤ 0.5 fps
  3. Use ≤ 5% mean annual flow for river intakes
  4. No disruption of natural thermal stratification for lake intakes

  Track II allows permittees to conduct site-specific studies that demonstrate alternative IM&E reduction measures can provide a level of reduction comparable to that required by Track I.

  Phase I also allows permittees to demonstrate that compliance costs associated with Tracks I and II would be unreasonable; or that air quality impacts, energy generation impacts ("energy penalties"), or other impacts not related to impingement mortality and entrainment (IM&E), could outweigh the additional IM&E effects and therefore justify an open loop system.

- **Phase II: Existing power generators withdrawing ≥50 MGD** (final regulation, 40 CFR 125.93)
  Phase II applies to existing power generating facilities that withdraw ≥ 50 MGD that commenced construction on or before January 17, 2002; and any modification of or addition to such a facility that does not meet the definition of a new facility at 40 CFR, Part 125.83. According to the Phase II rule, an existing facility must meet BTA by doing one of the following:

  1) Demonstrate that technology in use reduces intake capacity to a level commensurate with that of a closed-cycle, recirculating cooling system.

  2) Implement design & construction technologies, operational measures, and/or restoration measures that meet specified performance standards compared to a calculation baseline:

     a) For facilities with CWIS on a freshwater river or stream:
        i) If intake flow is <5% of annual mean river flow, reduce impingement mortality (IM) by 80-95%;
        ii) If intake flow is ≥5% of annual mean river flow, reduce IM 80-95% & entrainment 60-90%.

     b) For facilities with CWIS on a lake or reservoir other than the Great Lakes:
        i) Reduce IM by 80-95%; no disruption of the natural thermal stratification or turnover pattern of the source water, if the intake capacity is increased.

     c) For facilities with CWIS on a Great Lake:
        i) Reduce IM by 80-95% and entrainment by 60-90%.

  3) Demonstrate that the facility qualifies for a site-specific determination of BTA because its costs of compliance would be significantly greater than the environmental benefits of compliance with the performance standards.

  4) Installation of submerged cylindrical wedgewire screen technology, if the intake meets certain requirements in 40 CFR Part 125.99.

- **Phase III: Existing manufacturing facilities withdrawing ≥ 50 MGD***(proposed regulation, 40 CFR 125.100)
  EPA has proposed regulations that will apply to existing manufacturing facilities. In the proposed rules, it is recommended that existing manufacturing facilities meet similar information submittal and performance standard requirements as those for existing power generators (Phase II). Final Phase III regulations are expected to be completed in 2006. (**A final decision has not been made regarding which size manufacturing facilities must comply with Phase III. In the proposed rule, EPA suggests 3 alternate "cut-offs" to define which will have to comply: dischargers that withdraw 1) ≥ 50 MGD, 2) ≥ 200 MGD, or 3) ≥ 100 MGD and withdraw waters from a Great Lake.*)

Information Needed for Existing Facilities

In order to make a BTA demonstration, certain information is required, in the form of a "Comprehensive Demonstration Study" (CDS). The following is a brief summary of CDS requirements (more detail is given in the attached guidance and in the federal regulations, which can be found at: http://www.epa.gov/ost/316b/):

Comprehensive Demonstration Study (CDS)

A CDS is required to describe CWIS operations, characterize IM&E, and to confirm that chosen measures will meet BTA standards. Facilities that can reduce flows equal to that of a closed-cycle system are not be required to submit a CDS; others (e.g., through-screen velocity ≤0.5 fps; <15% utilization rate; or withdraw <5% river flow) may only have to submit certain sections of the CDS. The following is a summary of the information that may be included in a final CDS report, depending upon the compliance alternative selected:

1) *Proposal for Information Collection (PIC).* This proposal describes how the permittee intends to demonstrate that their proposed (or existing) CWIS will meet BTA standards.

2) *Source Waterbody Flow Information.* Information about the source waterbody's flow, physical configuration, hydrology, and thermal stratification is required to make decisions about which performance standards apply and what types of measures may be appropriate to prevent adverse environmental impacts from the CWIS.

3) *Facility, Cooling System, and Cooling Water Intake Structure (CWIS) Information.* Information regarding the site layout, outfalls and intakes, and cooling water systems is necessary to describe the range of physical, chemical, and biological impacts which could be encountered and to fully investigate the potential for organisms to become entrapped within or impinged on parts of the CWIS, and/or entrained in the water circulated through the system.

4) *Impingement Mortality and/or Entrainment (IM&E) Characterization Study.* The IM&E study provides information to support the development of a calculation baseline and to characterize current and/or estimate future potential for IM&E. In order to properly assess the potential for environmental impact, a 1-3 year biological survey may be necessary to establish the aquatic life present in the area. These studies include taxonomic identification and characterization of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) that are in the vicinity of the existing or proposed CWIS.

5) *Technology and Compliance Assessment Information. 1) Design and Construction Technology Plan.* This plan explains the technologies and/or operational measures which are in place or proposed to meet BTA requirements, including design plans (e.g., design and engineer calculations and estimates) for the CWIS. 2) *Technology Installation and Operation Plan.* This plan: (a) guides facilities in the installation, operation, maintenance, monitoring, and adaptive management of selected design and construction technologies and operational measures; (b) provides a schedule and methodology for assessing success in meeting applicable performance standards; and (c) provides a basis for determining compliance with the rule requirements.

6) *Restoration Plan (optional).* Facilities may use restoration measures that produce and/or result in levels of fish and shellfish in the facility's waterbody or watershed that are substantially similar to those that would result through compliance with the applicable performance standards or alternative site-specific requirements.

7) *Information to Support a Site-specific Determination of BTA (optional).* Permittees may request a site-specific determination of BTA if they can demonstrate that costs would be significantly greater than those considered by EPA when establishing the applicable performance standards.

8) *Verification Monitoring Plan.* This plan is the permittees proposal for measuring the efficacy of the implemented design and construction technologies and/or operational measures. The plan should include at least two years of monitoring to verify the full-scale performance of the proposed or already implemented design and construction technologies and/or operational measures.

Compliance Schedule

316(b) rules require facilities to comply with the information submittal requirements described above in their WPDES permit application. However, 40 CFR 125.95(a) allows existing facilities with permits that expire before July 7, 2008, to request an extension up to January 7, 2008. The following is an example schedule that was proposed by power generating facilities, which takes advantage of this entire extension:

Task	Approximate Time Allowed	Suggested Due Date
Prepare RFP and select contractor	---	10/30/04
Prepare and submit PIC	8 weeks	12/31/04
State Review of PIC and Address Comments	~75 days	3/15/05[2]
Complete baseline IM&E sampling	1 year[1]	3/31/06
Analyze IM&E data, make decisions on compliance *(assumes May-Sep sampling)*	3 months	6/30/06[2]
Engage in site-specific studies appropriate to support compliance approach	1 year	6/30/07
Prepare and submit final CDS report	7 months	1/7/08[3]

[1] based on augmenting sampling database from previous studies, which was shown to still be relevant

[2] Frequent communication between the permittee and the DNR is essential; it is recommended that regular meetings and./or conversations occur at major milestones throughout the process (e.g., at the end of the 2005 summer sampling periods, mid-way through the 2006 planning period, etc.) to ensure that all agree as to the scope and details of work planned and completed.

[3] this is the final date allowed by the Phase II regulations and it cannot be extended.

Permit Reissuance/Staff Responsibilities

Staff in the Bureau of Watershed Management's WW Permits and Pretreatment Section are responsible for permit reissuance activities for all Phase I & II facilities, and therefore will be primarily responsible for coordinating the 316(b) review and approval process. They will be responsible for determining which staff should be consulted with (e.g., regional WPDES permits & compliance staff; Chapter 30, fisheries, and other staff; the CWIS coordinator; etc.) in order to make decisions regarding whether the existing or proposed location, design, construction, and capacity of a CWIS at an existing facility reflects BTA for minimizing adverse environmental impact.

The CWIS coordinator, (currently Kari Fleming, in the Bureau of Watershed Management's Water Quality Standards Section) is responsible for the development and maintenance of the attached guidance, standard permit language, and other support materials, and also coordinates the statewide implementation of this program. The CWIS coordinator may also contribute expertise and assist in making BTA determinations for individual facilities, as needed.

The permittee is responsible for providing the information needed to determine whether a CWIS will meet BTA standards. Once this information is made available, the Department will determine which s. 316(b) performance standards apply and then review and approve plans, biological studies, source water information, and technologies needed to meet BTA criteria. Once the Department has determined whether the proposed (or existing) CWIS will meet applicable performance standards, the WPDES permit should be reissued with requirements that are necessary to attain and demonstrate compliance with the standards (see the attached guidance for more details).

Cc: Chuck Hammer - LS/5
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Water Leaders
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